

REMARKS/ARGUMENTS

Claims 1-51 are pending in this application. Claims 1-50 stand rejected. By this Amendment, claims 1, 6, 12, and 38 have been amended. The amendments to claims have been made to improve the form thereof. New independent claim 51 has been added. Support for new claim 51 can be found in original claims 1, 18, 21, and 22. No new matter is added by this amendment. In view of the amendments and remarks set forth below, Applicants respectfully submit that each of the pending claims is in immediate condition for allowance.

Allowability of claims 1-7, 29, and 30-33

Claims 1-7, 29, and 30-33 stand rejected under 35 USC §103(a) as being unpatentable over U.S. Patent No. 5,174,649 (“Alston”) in view of U.S. Patent No. 6,406,172 (“Harbers”). Applicant respectfully traverses this rejection.

Among the limitations of independent claim 1 not present in the cited references is the feature of “each of the semiconductor chips is integrated into the headlight without a housing.”

As recited in the claims, the claimed semiconductor chip is integrated into the headlight without a housing. In contrast, the prior art references disclose LED devices in housings. By integrating semiconductor devices without a housing into the headlight as in the claimed invention, the light input of the optical concentrator is closer to the LED element than it would be using an LED with a housing. Due to this proximity, a smaller optical concentrator can be used which yields a higher light density when compared to a larger concentrator with a same divergence.

Alston is cited for its teaching of a semiconductor chip. However, the semiconductor chips shown in Alston are “off the shelf” PC board mountable LEDs, each LED having a housing. The PC mounted LEDs 101-103 are shown in Figures 1a and 1b. Each of these LEDs is clearly shown

having a housing. Therefore, Applicant respectfully submits that Alston fails to disclose the explicitly recited semiconductor chip, i.e., a semiconductor chip without a housing.

Harbers was cited for its disclosure of an emission characteristic of the headlight. Whether or not Harbers discloses this limitation is irrelevant as Harbers fails to disclose the explicitly recited semiconductor chip without a housing. Thus, Harbers fails to cure the above deficiency in Alston. Therefore, claim 1 is allowable over the cited combination.

Dependent claims 2-37 depend from and contain all of the limitations of claim 1. These dependent claims also recite additional limitations which, in combination with the limitations of claim 1 are neither disclosed nor suggested by the combination and are also directed toward patentable subject matter. Therefore, dependent claims 2-37 should also be allowed.

Allowability of claims 8-26, 28, 38-44, and 46-50

Claims 8-26, 28, 38-44, and 46-50 stand rejected under 35 USC §103(a) as being unpatentable over Alston and Harbers in view of U.S. Patent No. 5,727,108 (“Hed”). Applicants respectfully traverse this rejection.

Applicants notes that Hed discloses an illumination source 91 as shown in Figure 9 and discussed at column 11, lines 52 *et seq.* However, at no time is the main light source, illumination source 91, described as a semiconductor chip integrated into a headlight element without a housing.

Claims 8-26 and 28

Claims 8-26 and 28 depend from claim 1. As discussed above, the combination of Alston and Harbers fails to render claim 1 unpatentable. Hed was not added to cure the deficiency in the combination of Alston and Harbers discussed above, nor does it cure the deficiency. As such,

Applicants respectfully submit that dependent claims 8-26 and 28 are allowable over the cited combination of references.

Claims 38-44 and 46-50

Independent claim 38, from which claims 39-44 and 46-50 ultimately depend, explicitly recites “at least one semiconductor chip...the semiconductor chip being integrated into the headlight element without a housing.”

As discussed above with respect to independent claim 1, the above quoted limitation is not present in the combination of Alston and Harbers. Hed was not cited to cure the above noted deficiency. Hed fails to disclose a semiconductor chip being integrated into the headlight element without a housing. Therefore, claim 38 is allowable over the cited combination.

Claims 39-50 depend from and include all of the limitations of independent claim 38. These dependent claims include additional limitations, which in combination with the limitations of claim 38 are also allowable. Therefore, claims 38-50 are allowable over the cited combination.

Allowability of claim 51

New claim 51 is directed to a headlight element having at least one primary optic element such as the headlight element shown in Figures 6 and 7 of the present application. Applicants note that claim 51 is allowable for several reasons.

Initially, Applicants note that claim 51 explicitly recites that the concentrator sidewalls “which connect the light input to the light output are designed in such a way that direct connecting lines which run on the sidewalls run essentially in a straight line between the light input and the light output.” In contrast, Hed discloses compound parabolic concentrators (CPCs) and a light concentrator formed from two curved surfaces. See Hed, col. 5, lns. 2-3. By definition, a curved

surface does not run in a straight line from input to output. Therefore, for at least this reason, claim 51 is allowable over Hed.

Second, claim 51 recites that the concentrator is a dielectric concentrator whose base body is a solid body, which is composed of a dielectric material. Hed explicitly teaches to use hollow concentrators instead of solid body concentrators. While Hed notes in the Background of the Invention that one could use a CPC made of solid dielectric material, the volume of material required for such a solid dielectric material CPC has a negative impact on cost. Furthermore, the output of the solid dielectric CPC must be output into a material of the same or higher dielectric constant to prevent total internal reflection causing return of some of the light to the input aperture. See Hed col. 1, lns. 43-50. Therefore, Hed teaches away from the use of a solid dielectric concentrator as discussed in the Background of the Invention and a person of skill in the art would not use such a solid dielectric concentrator.

Finally, claim 51 recites a boundary surface of the solid body concentrator that is curved like a lens. Hed fails to disclose this feature. Hed does not disclose a solid body concentrator having a boundary surface curved like a lens. Hed explicitly teaches the use of hollow concentrators instead of solid body concentrators. Therefore, for at least the three reasons discussed, Applicants respectfully submits that claim 51 is allowable over the cited references.

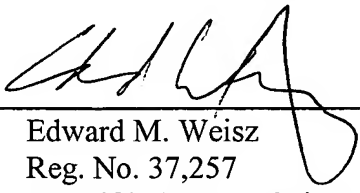
Conclusion

Applicants have responded to all of the rejections recited in the Office Action. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

If the Examiner believes an interview would be of assistance, the Examiner is encouraged to contact the undersigned at the number listed below.

It is believed that no additional fees or charges are required at this time in connection with the present application. However, if any fees or charges are required at this time, they may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,
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